

REMARKS

Claims 1-10 are pending in the application. Claims 1-10 stand rejected. Claims 1, 2, 3, 7, 9 and 10 are being amended. No new matter is believed to be introduced by way of the amendments.

Interview Summary

A telephonic interview took place on April 21, 2010 between Examiner Callaway, Applicants' Attorney, Timothy J. Meagher, and Ashley Tarokh. The parties discussed proposed amendments to the claims as well as the cited references Kasazumi *et al.* (E.P. Patent Number 0450644), Hesselink *et al.* (U.S. Patent Number 5,995,251), and Waldern (U.S. Patent Application Publication Number 2004/0108971). No agreement was reached.

Applicants' Attorney thanks Examiner Callaway for her time and helpful comments.

Claim Objections

Claim 10 is objected to for including the word OSPR that is deemed as undefined. Claim 10 is being amended to include the term "one step phase retrieval (OSPR)."

Election and Restrictions

The Office Action deems new Claims 11-17 as being directed to an invention distinct from originally filed Claims 1-10. The Office Action has withdrawn Claims 11-17 from further consideration in this Application.

Applicants reserve the right to file a continuing application or take such other appropriate action as deemed necessary to protect the non-elected inventions.

Rejections Under 35 U.S.C. §102(b)

Claim 7 was rejected under 35 U.S.C. §102(b) as being anticipated by Kasazumi (E.P. Patent Number 045064, hereinafter referenced as "Kasazumi").

Claim 7 is now amended. Support for this amendment can be found in the Application, as originally filed, at least on page 1, line 26 through page 2, line 2.

Applicants' amended Claim 7 relates to a method for increasing the viewing angle of a hologram on a pixellated hologram display device having a predetermined resolution. A pixellated phase mask is disposed with respect to a hologram display device such that the holograms are viewed through the pixellated phase mask. Since the resolution of the pixellated phase mask is greater than that of the hologram display device, disposing the pixellated phase mask with respect to the hologram display device allows for the viewing angle to be increased by several times, providing an increased resolution.

In contrast to Applicants' Claim 7, Kasazumi describes a hologram recording device that displays conventional images. Referring to Fig. 5 of Kasazumi, the hologram recording device employs a reference beam to form an interference pattern on a photographic plate 60 (see page 6, line 54 to page 7, line 2). A hologram is formed in a photographic plate 60 by interference of an object and a reference beam (a conventional technique for fabricating a hologram) and is recorded by the hologram recording device. Although Kasazumi records the holograms, the final image displayed by on the liquid crystal device 1 is a conventional image and not a hologram.

Therefore, Kasazumi merely describes a hologram recording device. Kasazumi offers no suggestion of "disposing a pixellated phase mask with respect to the pixellated hologram display device for viewing the hologram, ..., the holograms being viewed through the pixellated phase mask," as required by Applicants' Claim 7.

Therefore, it is Applicants' position that amended Claim 7 is allowable over Kasazumi. Accordingly, Applicants respectfully request that the rejection of this claim under 35 U.S.C. § 102(b) be withdrawn.

Rejections Under 35 U.S.C. §103(a)

Claims 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Kasazumi in view of Hesselink *et al.* (U.S. Patent Number 5,995,251, hereinafter referenced as "Hesselink").

Claim 8 includes similar elements as Claim 7. As explained above, Kasazumi merely describes a hologram recording device that displays conventional images. Kasazumi does not display holograms and offers no suggestion of "viewing the hologram through a pixellated phase mask," as required by Applicants' Claim 8.

Similarly, Hesselink fails to teach or suggest displaying holograms through a pixellated phase mask. Referring to Figs. 1-2, Hesselink's apparatus includes a spatial light modulator (SLM) 20, an optical focusing lens 24, a holographic storage material 26, and a spatial light detector 32 comprising an array of individual light detectors 34. In operation, the light from the SLM 20 is focused by lens 24 onto the CCD 32 and a hologram is recorded in storage material 26 by reference beam 38. The spatial light modulator is located at an object plane 21 of lens 24 and the CCD 32 is located at a corresponding image plane 41 (see column 2, lines 20-22 and column 3, lines 48-50). During the readout process (see Fig. 3, column 4, lines 38-60, and column 2, lines 41-47) reference beam 38 reproduces the converging part of the beam 39 to illuminate CCD 32. Therefore, the image on SLM 20 is not a hologram but a conventional image, which is focused onto CCD 32 during recording, the latter portion of this beam being reproduced during data readout. Although Hesselink's apparatus may include a phase mask 29 adjacent to the SLM 20, the phase mask is only used to reduce the intensity of light at zero spatial frequency and to make it easier to record high quality holograms in the storage material 26 (column 5, lines 19-21). This makes it clear that the holographic storage material 26 only stores a hologram and a hologram is not displayed on SLM 20.

Therefore, Hesselink offers no suggestion of displaying a hologram on SLM 20 and does not teach or suggest "viewing the hologram through a pixellated phase mask," as required by Applicants' Claim 8.

A hypothetical system combining the teachings of Kasazumi and Hesselink may include an SLM and a phase mask but it does not include "viewing the hologram through a pixellated phase mask," as required by Applicants' Claim 8. Accordingly, Applicants respectfully request that the rejection of this claim under 35 U.S.C. § 103(a) be withdrawn.

Claims 1-6 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kasazumi in view of Hesselink, and Waldern (U.S. Patent Application Publication Number 2004/0108971, hereinafter referenced as "Waldern").

Claim 1 is now amended. Support for this amendment can be found in the Application, as originally filed, at least on page 1, line 26 through page 2, line 2.

Claim 1 relates to a holographic display that includes a spatial light modulator (SLM) and a pixellated phase mask. The SLM includes a predetermined resolution. Holograms displayed

on the SLM are viewed through the phase mask and have a resolution higher than the predetermined resolution.

As explained above, Kasazumi merely describes a hologram recording device that displays conventional images. Kasazumi does not display holograms and offers no suggestion of “the SLM displaying holograms that are viewed through the phase mask,” as required by Applicants’ Claim 1.

Similarly, as described above, Hesselink is a hologram recording device that displays conventional images on the SLM 20. Hesselink offers no suggestion of displaying a hologram on SLM 20 and does not teach or suggest “the SLM displaying holograms that are viewed through the phase mask,” as required by Applicants’ Claim 1.

Waldern relates to transmitting an image into the eye of an observer. In operation, Waldern creates areas of high resolution images in the direction of an observer’s gaze. Waldern offers no suggestion of displaying a hologram on SLM 20 and does not teach or suggest “the SLM displaying holograms that are viewed through the phase mask,” as required by Applicants’ Claim 1.

Since the cited references, Kasazumi, Hesselink, and Waldern, offer no suggestion of displaying holograms on an SLM, a hypothetical system combining the teachings of these references would not include this element of Applicants’ amended Claim 1. Therefore, it is Applicants’ position that amended Claim 1 is allowable over Kasazumi in view of Hesselink, and Waldern. Accordingly, Applicants respectfully request that the rejection of this claim under 35 U.S.C. § 103(a) be withdrawn.

Independent Claims 2 and 9 are being amended to include similar elements as Claim 1. Accordingly, Applicants respectfully request that the rejection of these claims under 35 U.S.C. §103(a) be withdrawn for the reasons presented above.


Since Claims 3, 4, 5, 6, and 10 depend from respective independent Claims 1, 2 and 9, Applicants respectfully request that these dependent claims be allowed for at least the same reasons as the base claim from which they depend.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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